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Electric two wheelers, zero emission solution for urban door to door transportation

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The noise and exhaust pollution coupled with increasing congestion faced by urban centres demands new personal mobility solution for faster door to door connectivity. The advancement in electric power train and lowering cost of Li-ion battery is made it possible to develop light weight fully electric two wheeler with a range sufficient to cover urban commuting distance.

Daily travel characteristics

The population of cities is increasing worldwide and consequently mass transportation facilities are getting severely stressed. This contributes to increased use of privately owned vehicle (POV) and it adds to pollution and congestion. The fig.1 shows a comparison of travel characteristics of USA and UK and the figure highlights the congestion issues faced by later country. The present power train and battery technologies are capable of developing cost effective solution to these challenges in the form of light electric two wheelers (LETW), which meets the average daily travel distance.

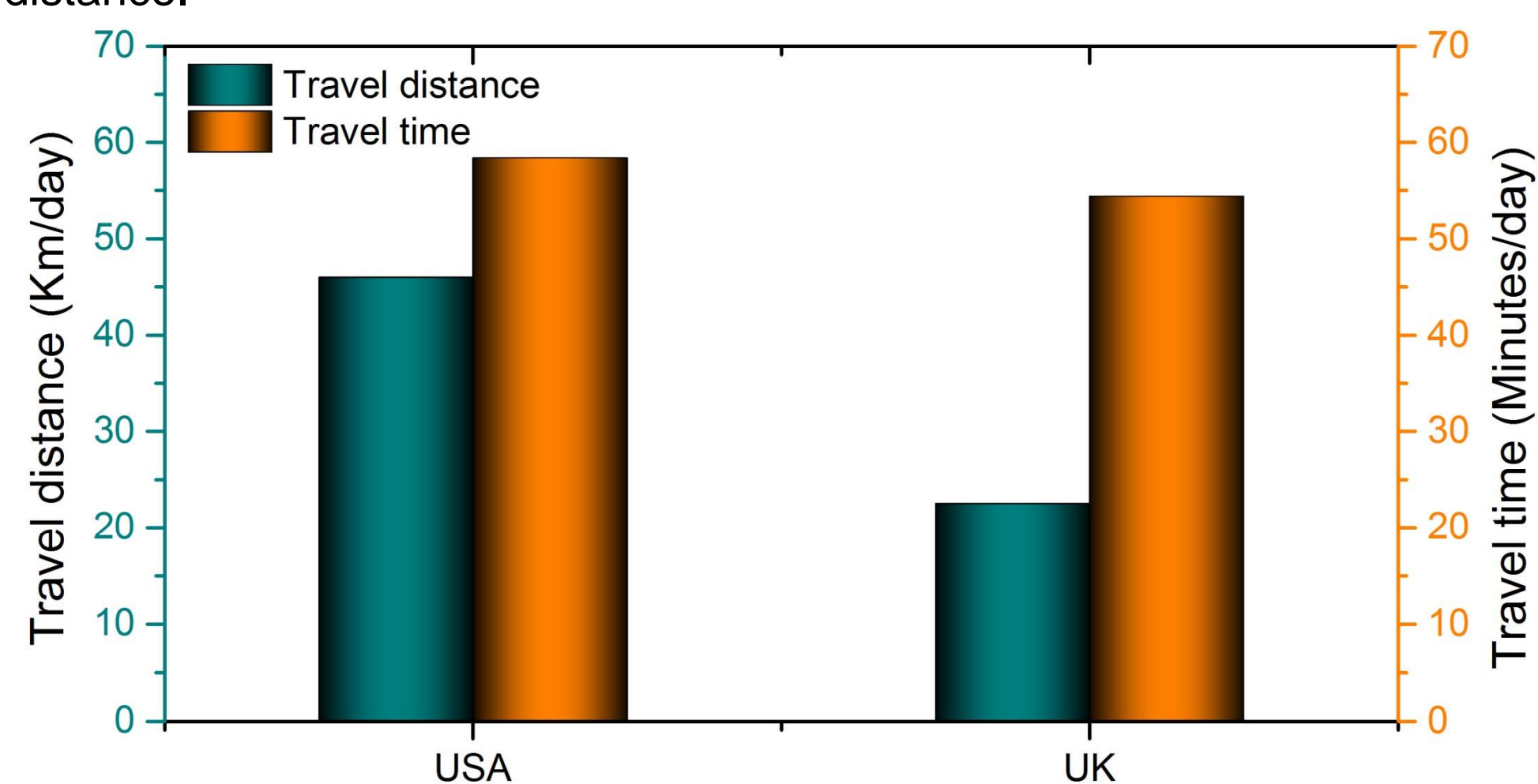


Fig.1. The daily travel characteristics of USA and UK [1]

Structure of light electric two wheelers

A layout of LETW is shown in fig.2. A rechargeable battery will supply power to motor via power electronic converter. The power from motor will be transferred to wheels either directly or via transmission, usually a single speed. The motor controllers can be configured to include regenerative braking; thus extending the range of LETW.

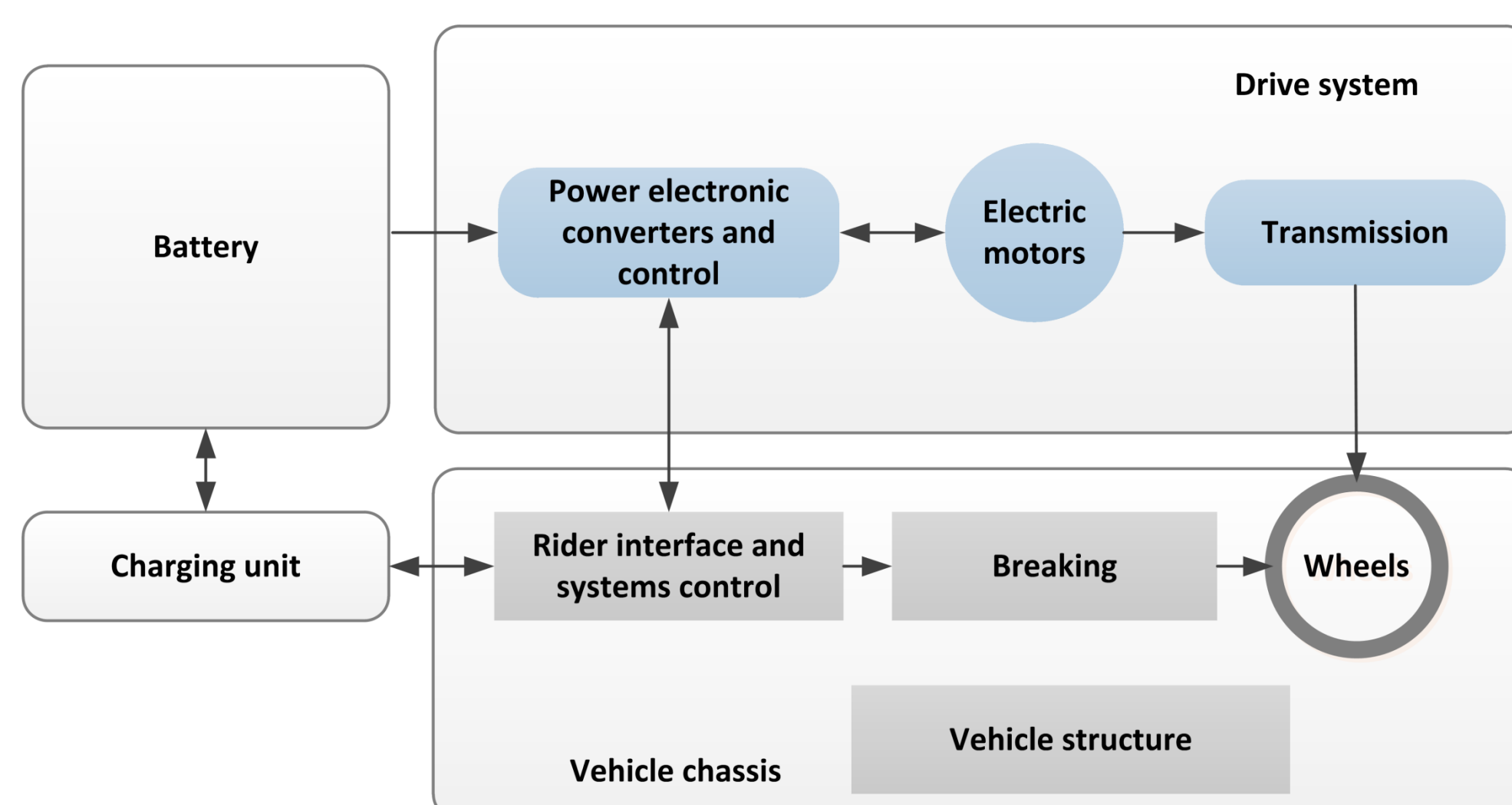


Fig.2. The layout of LETW



Fig.3. Yamaha EC-03 is a LETW with range of 45 km, maximum speed of 45 kmph and weighs only 56kg (in comparison, a 50 cc scooter weighs nearly 90kg)

Present challenges and future of LETW

Educating the masses about the new developments in LETW and clearing the misconception about the range is a major challenge. Development of low cost powertrain will help in bringing down the cost of ownership of LETW compared to IC engine powered counterpart. The price of Li-ion battery is expected to fall as this decade progresses; this along with zero emission cities expected to come around the world in next decade offers huge potential for wider adoption of LETW.

Reference:

[1] Genevieve Giuliano and Dhiraj Narayan. Another look at travel patterns and urban form: The US and Great Britain. Urban Studies, 40(11):2295{2312, October 2003.